ISSN: 0975-833X

Available online at http://www.journalcra.com

International Journal of Current Research
Vol. 9, Issue, 01, pp.44813-44816, January, 2017

INTERNATIONAL JOURNAL OF CURRENT RESEARCH

CASE STUDY

RIGID INTERNAL FIXATION IN A FRACTURED PAEDIATRIC MANDIBLE LEADING TO ALTERED JAW GROWTH DURING ADOLESCENCE- A CASE REPORT

***Swati R. Bharadwaj, Deepak Kulkarni, Lakshmi Shetty, Uday S. Londhe, Shraddha Channe and Nilesh Khandelwal**

MDS part 3, Oral Surgery, India

ARTICLE INFO

Article History:
Received 19th October, 2016
Received in revised form
22nd November, 2016
Accepted 29th December, 2016
Published online 31st January, 2017

Key words:

Trauma, Mandible fracture,
Rigid fixation, Paediatric jaw fracture.

ABSTRACT

This is a case report of a 30 year old female who reported to the Department of Oral and Maxillofacial Surgery, Dr D. Y. Patil Dental College & Hospital, Pimpri, Pune with a chief complaint of swelling in the lower left back region of the jaw. The patient had a history of trauma to left angle region 25 years back (at the age of 5 years), for which she was treated extraorally under General Anesthesia. Clinical examination and radiographic findings revealed a metallic compression plate present on the left mandibular second and third molar region along with reduced height of mandible on left posterior body region and presence of impacted second and third molar teeth. The patient was operated under General anaesthesia for removal of the implant and the impacted teeth. There was no intraoperative or postoperative complications reported and healing occurred uneventfully.

Citation: Swati R. Bharadwaj, Deepak Kulkarni, Lakshmi Shetty, Uday S. Londhe, Shraddha Channe and Nilesh Khandelwal, 2017. "Rigid internal fixation in a fractured paediatric mandible leading to altered jaw growth during Adolescence- A case report", *International Journal of Current Research*, 9, (01), 44813-44816.

INTRODUCTION

Paediatric mandibular fractures have been a challenging task in Oral & Maxillofacial Surgery, which has given rise to many opinions about the management of these. As these fractures are rare, its presentation and prospective treatment advocated is of utmost importance to study its subsequent effect on growth and function of the jaw (Myall, 2009). Pediatric facial trauma patient provides several considerations that are absent in adults. First, the pediatric patient has tremendous advantages such as an accelerated ability to heal in a short time, aided by the well vascularized tissues of the face. Second, through the assistance of growth potential and ability to adapt, recovery of damaged tissues and function is much better than in adults (Eppley, 2005). Despite these, certain distinctions exist that must be considered. This includes an appreciation of the unique characteristics and anatomy of the developing face, the different facial injury patterns, and the potential growth implications from traumatized facial structures that make long-term follow-up of these patients an important step. These factors, combined with the limited experience may make certain treatment decisions different than what might be undertaken in an adult. Pediatric mandible fractures are uncommon and have been treated by a wide variety of fixation methods. Incomplete or undisplaced fractures as well as fractures of the subcondylar region are treated by traditional methods of closed reduction. Thoren *et al*. (2001) concluded that immediate mobilization, even when there was complete dislocation of the condylar process, resulted in a satisfactory long-term functional outcome with minimal asymmetry. Displaced fractures are better treated by open reduction and internal fixation (ORIF). The goal of ORIF is to maintain balance between stability of the fracture site and the potential risks of operative exposure of the bone. In children, this balance is particularly important as the implantation time of the metal implants is essentially for most of the patient's lifetime. Therefore, the use of resorbable fixation implants in developing facial bones is particularly appealing (Mouzakes and Koltai, 1998). Rigid metal fixation of mandibular fractures in children, can be complicated by a mixed dentition that can occupy the entire vertical dimension of the jaw and places teeth and the inferior alveolar nerve at risk during screw insertion. The drilling is done through the outer cortex only so as to avoid drilling into unerupted teeth. In addition, ongoing development of the mandible poses risk of intrabony translocation of metal plates and screws, hampering growth of the jaw and causing teeth disturbances and difficulty with secondary removal when needed. In children, these fractures are usually exposed through an intraoral approach unless an existing laceration allows for direct access to the bone.

****Corresponding author: Swati R. Bharadwaj,***
MDS part 3, Oral Surgery, India

Case report

A 30 year old female reported to the Out Patient Department of Oral & Maxillofacial Surgery, Dr D. Y. Patil Dental College, Pimpri, Pune with a chief complaint of pain and swelling in lower left back region of jaw since 3 weeks. The pain was dull and intermittent in nature which aggravated on chewing. There was no relief obtained with medications. There were no other associated signs and symptoms. The patient revealed a history of trauma to the left side of mandible at the age of 5 years, followed by which she was operated for the same under GA, at a rural hospital. There were no data regarding her previous treatment, other than the vague verbal history by the patient itself. There was no history of extraction or any other dental treatment. On examination, an extraoral diffuse swelling was seen on the left mandibular angle region. Also a surgical scar on the left submandibular region was seen, suggesting that the patient was operated through extraoral approach (Fig. 1). On palpation the swelling was tender with no changes in the colour, texture or temperature of the overlying skin. Also a hard protuberance was felt while palpating along the inferior border of the mandible on left side, around 4 cm ahead from the angle of mandible. Intraoral inspection showed a missing second molar and a partially erupted third molar in the lower left back region of the jaw with an inflamed overlying mucosa, mimicking pericoronitis. The patient revealed about missing 37 and unerupted 38 (Fig. 2). Palpation of the same region elicited sharp shooting pain which relieved on its own in a while. While palpating the external oblique ridge a sharp protuberance was felt on the buccal aspect of missing 37. Orthopantomogram (OPG) revealed a radio-opaque rigid metallic rigid fixation implant extending anteroinferiorly from the inferior border of the mandible in the region of 36, running posterior in an oblique fashion along the height of the mandible, upto the mesial aspect of horizontally placed 38, secured with two metallic screws (Fig. 3). The patient was admitted for preoperative administration of intravenous antibiotics and analgesics and was operated for plate removal under General anaesthesia. After exposure of the plate and screws, the unscrewing was not possible due to the bony overgrowth (Fig. 4). The plate and screws were exposed and removal was achieved by creating a trough adjacent to the neck of the screw, using a rotary instrument and 701 straight fissured bur. (Fig. 5) The impacted second and third molars were removed surgically (Fig. 6). No intraoperative or immediate postoperative complication developed. Patient was given postoperative antibiotics and analgesics & discharged with no complaints.

Fig.1. Surgical scar on the left submandibular region resulting from previous ORIF done extraorally

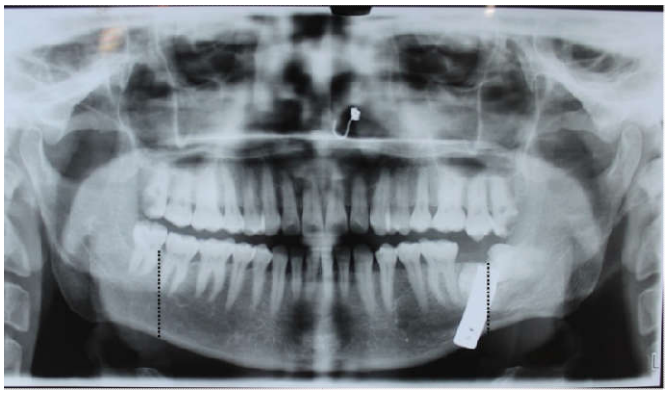

Fig.2. OPG of the patient showing an obliquely placed metal plate across left body of the mandible, in the region of impacted 37 & 38 teeth. Note the reduced vertical height of left posterior body of mandible in 37 & 38 region, as compared with the right side

Fig.3. Intraoral aspect showing missing 37 and a partially erupted 38

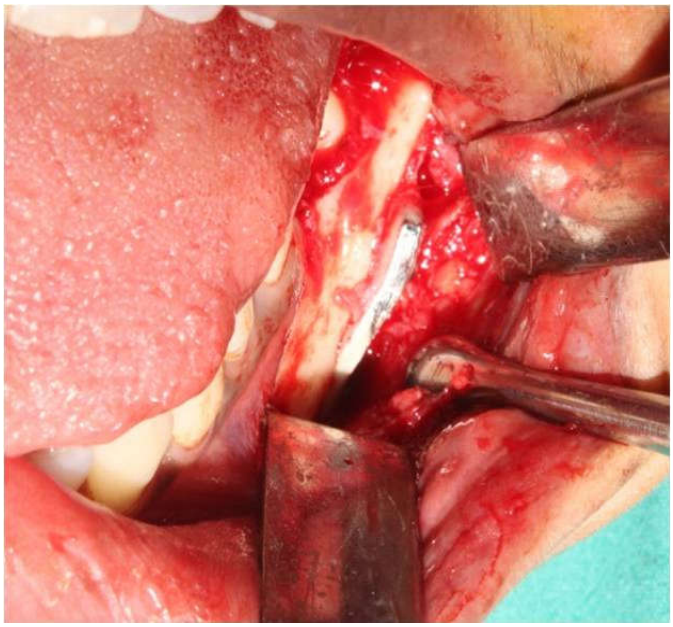

Fig.4. The metallic compression plate seen at the posterior body of the mandible, left side, after the exposure through intraoral approach

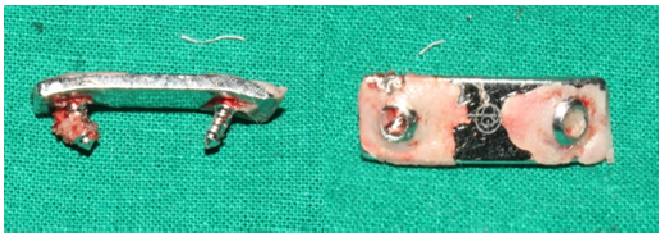

Fig.5. The metallic compression plate and screws after the retrieval

Fig.6. The impacted 37 & 38 teeth after the surgical removal

Fig.7. Healed surgical site after 6 months

RESULTS

The patient was recalled on follow-up visits at intervals of ten days, one month and six months. Six months follow-up showed an adequately healed surgical site with no fresh complaints. (Fig. 7)

DISCUSSION

Children have an immense capacity for healing in shortest possible time with minimum complications. The assistance that growth can give, coupled with the inherent ability of young bone, periosteum, and soft tissues to adapt to new situations, is quite different from what we see in adults. Also the mandible houses many tooth buds and, as these teeth mature and erupt, there is a corresponding expansion of the mandible and development of the alveolus. The latter view was proposed formally by Moss (1909) in his functional matrix theory of growth and it has withstood the test of time. To guide surgeons treating mandibular fractures in children, they need to first review the growth, describe how injury can affect such growth, and explain how to harness the process of growth to a good effect. This information is important in making therapeutic decisions about the management of such injuries (Myall, 2009). ORIF of the mandible in children should be done using smaller-gauge resorbable miniplates with monocortical screws. As the pediatric mandible is fairly malleable, fractures tend to get less displaced and rarely comminuted. Because the dentition is often mixed and bone growth is expected, absolute compression of the fracture edges is not necessary at this stage. In the very young, 2 weeks of immobilization is sufficient and, up to the age of puberty, 3 or 4 weeks will suffice in most instances (Amaratunga, 1987). Fracture locations after the age of 10 assume a pattern similar to that in adults (Thoren *et al*., 1992). Conventional wisdom tells us that to best fulfill these aims, the bony fragments must be accurately aligned. Efforts to ensure this alignment lead to complex methods of treatment, including open reduction. However, perfect alignment is not always necessary to ensure complete success.

Conclusion

Mandibular growth can be increased or decreased by trauma and its treatment. Thus, long-term follow-up is the rule. This enables aberrations of growth to be intercepted and treated with appliance therapy or by a combination of orthodontics and surgery at an appropriate juncture (Myall, 2009). There are many types of fixation that can be applied to mandibular fractures in children, ranging from maxillomandibular fixation, to lingual splints, to various forms of rigid fixation. In certain circumstances, no fixation at all is sufficient. The speed with which fractures in children heal at various ages, the complexity, the presence of concomitant injury, and the surgeon's experience with a variety of surgical approaches all factors help to make the appropriate treatment choice.

Acknowledgements

We would like to thank the authors, all the participants, assistants, and nursing staff for their contribution & help. There is no financial relationship between any author and any commercial firm(s), which may pose a conflict of interest.

Conflict of interest: None.

REFERENCES

Amaratunga N. 1987. The relation of age to the immobilization period required for healing of mandibular fractures. *J Oral Maxillofac Surg*., 45:111–3.

Eppley BL. 2005. Use of resorbable plates and screws in pediatric facial fractures. *J Oral Maxillofac Surg*., 63:385–91.

Moss M. and Salentijn L. 1909. The primary role of functional matrices in facial growth. *Am J Orthod*., 55: 566–77.

Mouzakes J. and Koltai PJ. 1998. The biology of pediatric facial fractures. *Facial Plast Surg Clin North Am*., 6:487.

Myall RWT. 2009. Management of Mandibular Fractures in Children. *Oral Maxillofacial Surg Clin N Am*., 21, 197–201.

Thoren H, Hallikainen D, Tateyuki L, *et al*. 2001. Condylar process fractures in children: a follow up study of fractures with total dislocation of the condyle from the glenoid fossa. *J Oral Maxillofac Surg*., 59(7):768–73.

Thoren H, Iizuka T, Halliikainen D, *et al*. 1992. Different patterns of mandibular fractures in children: An analysis of 220 fractures in 157 patients. *J Craniomaxillofac Surg*., 20:292-6.

****